Claims

1. A shielding system for a physical vapor deposition chamber, the chamber having a pedestal movable between a lowered loading and unloading position and a raised deposition processing position and surrounded by chamber interior lower, side and upper walls, the chamber further including a sputter target above the pedestal, the shielding system comprising:

a pedestal shield attachable to the pedestal and movable therewith between the lowered and raised positions, the pedestal shield surrounding and extending outward from the pedestal toward the chamber side or lower walls; and

a sidewall shield adapted to extend substantially around and within the chamber sidewalls, and downward from an upper portion thereof, the sidewall shield having a lower end extending inward and disposed adjacent the pedestal shield upper portion when the pedestal is in the raised position,

the pedestal shield and sidewall shield cooperating, when the pedestal is in the raised position, to prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber.

2. The shielding system of claim 1 wherein, when the pedestal is in the raised position, the pedestal shield and sidewall shield further cooperate to prevent line-of-sight or gas-scattered transmission deposition from sides of the pedestal shield facing toward the chamber upper walls to the side and lower walls of the deposition chamber.

3. The shielding system of claim 1 wherein the sidewall shield lower end is disposed below and outward of an upper surface of the pedestal when the pedestal is in the raised position.

4. The shielding system of claim 1 wherein the pedestal shield has an upper portion surrounding the pedestal and a lower portion extending downward therefrom around the pedestal toward the chamber lower wall.

5. The shielding system of claim 1 wherein the pedestal shield has an upper portion surrounding the pedestal, a lower portion extending downward therefrom around the pedestal toward the chamber lower wall and an outward portion extending away from the lower portion, and the sidewall shield has a lower end disposed below and outward of the pedestal shield upper portion and inward of the pedestal shield outward portion when the pedestal is in the raised position.

6. The shielding system of claim 1 wherein the pedestal shield has an upper portion surrounding the pedestal, a lower portion extending downward therefrom around the pedestal toward the chamber lower wall and an outward portion extending upward and away from the lower portion, and the sidewall shield has a lower end disposed outward of the pedestal shield upper portion and inward of the pedestal shield outward portion when the pedestal is in the raised position, the sidewall shield further having an outward portion between the chamber sidewall and the sidewall shield lower end disposed outward of the pedestal shield outward portion when the pedestal is in the raised position.

7. The shielding system of claim 1 wherein the pedestal shield has an upper portion surrounding the pedestal, a lower portion extending downward therefrom around the pedestal toward the chamber lower wall and an outward portion extending upward and away from the lower portion, and the sidewall shield has a lower end disposed below and outward of the pedestal shield upper portion and inward of the pedestal shield outward portion when the pedestal is in the raised position.

8. The shielding system of claim 6 wherein the sidewall shield has an outward portion between the chamber sidewall and the sidewall shield lower end disposed outward of the pedestal shield outward portion when the pedestal is in the raised position.

9. The shielding system of claim 1 wherein the sidewall shield lower end is disposed above the pedestal shield when the pedestal is in the raised position and the pedestal shield extends outward from the pedestal toward the chamber sidewalls and below the sidewall shield lower end.

10. The shielding system of claim 1 wherein the pedestal shield has an upper portion surrounding the pedestal and a lower portion extending downward therefrom around the pedestal toward the chamber lower wall, and the sidewall shield has an extension to the lower end thereof extending downward below the pedestal shield lower portion, and an inward portion extending upward from the extension, and wherein the pedestal shield lower portion is between the sidewall shield lower end extension and sidewall shield inward portion.

11. The shielding system of claim 1 wherein the pedestal shield has an upper portion surrounding the pedestal and a lower portion extending downward therefrom around the pedestal toward the chamber lower wall, and further including a bottom wall shield having a lower portion extending along the chamber lower wall, and inward and outward portions extending upward from the bottom wall shield lower portion, the bottom wall shield inward portion extending inward of the platform shield lower portion and the bottom wall shield outward portion extending outward of the platform shield lower portion.

12. The shielding system of claim 1 wherein the sidewall shield lower end is above the pedestal, when the pedestal is in the lowered position, a distance sufficient to permit a wafer to be horizontally loaded onto the pedestal.

13. The shielding system of claim 1 wherein the pedestal and sidewall shields are adapted to avoid contact with each other in the raised and lowered pedestal positions.

14. A shielding system for a physical vapor deposition chamber, the chamber having a pedestal movable between a lowered loading and unloading position and a raised deposition processing position and surrounded by chamber interior lower, side and upper walls, the chamber further including a sputter target above the pedestal, the shielding system comprising:

a pedestal shield securable to the pedestal and movable therewith, the pedestal shield having an upper portion surrounding the pedestal and a lower portion extending downward therefrom around the pedestal toward the chamber lower wall; and

a sidewall shield adapted to extend downward from an upper portion of the chamber sidewalls and having a lower end disposed below the pedestal shield upper portion when the pedestal is in the raised position,

the pedestal shield and sidewall shield cooperating, when the pedestal is in the raised position, to prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber, and line-of-sight or gas-scattered transmission of deposition from sides of the pedestal shield facing toward the chamber upper walls to the side and lower walls of the deposition chamber.

15. The shielding system of claim 14 wherein the pedestal shield has an upper portion surrounding the pedestal and a lower portion extending downward therefrom around the pedestal toward the chamber lower wall.

16. The shielding system of claim 14 wherein the pedestal shield has an upper portion surrounding the pedestal, a lower portion extending downward therefrom around the pedestal toward the chamber lower wall and an outward portion extending away from the lower portion, and the sidewall shield has a lower end disposed below and outward of the pedestal shield upper portion and inward of the pedestal shield outward portion when the pedestal is in the raised position.

17. The shielding system of claim 14 wherein the pedestal shield has an upper portion surrounding the pedestal, a lower portion extending downward therefrom around the pedestal toward the chamber lower wall and an outward portion extending upward and away from the lower portion, and the sidewall shield has a lower end disposed outward of the pedestal shield upper portion and inward of the pedestal shield outward portion when the pedestal is in the raised position, the sidewall shield further having an outward portion between the chamber sidewall and the sidewall shield lower end disposed outward of the pedestal shield outward portion when the pedestal is in the raised position.

18. The shielding system of claim 14 wherein the pedestal shield has an upper portion surrounding the pedestal, a lower portion extending downward therefrom around the pedestal toward the chamber lower wall and an outward portion extending upward and away from the lower portion, and the sidewall shield has a lower end disposed below and outward of the pedestal shield upper portion and inward of the pedestal shield outward portion when the pedestal is in the raised position.

19. The shielding system of claim 17 wherein the sidewall shield has an outward portion between the chamber sidewall and the sidewall shield lower end disposed outward of the pedestal shield outward portion when the pedestal is in the raised position.

20. A method of shielding a physical vapor deposition chamber, the chamber having a pedestal movable between a lowered loading and unloading position and a raised deposition processing position and surrounded by chamber interior lower, side and upper walls, the chamber further including a sputter target above the pedestal, the method comprising:

providing a shielding system having a pedestal shield secured to the pedestal and movable therewith between the lowered and raised positions, the pedestal shield surrounding and extending outward from the pedestal toward the chamber side or lower

walls, and a sidewall shield extending substantially around and within the chamber sidewalls, and downward from an upper portion thereof, the sidewall shield having a lower end extending inward and disposed adjacent the pedestal shield upper portion when the pedestal is in the raised position;

moving the pedestal to the lowered position in the chamber such that the sidewall shield lower end is above the pedestal a distance sufficient to permit a wafer to be horizontally loaded onto the pedestal; and

moving the pedestal to the raised position, the pedestal shield and sidewall shield cooperating to prevent line-of-sight or gas-scattered transmission of deposition from the sputter target to the side and lower walls of the deposition chamber.